

# Panel Actuators and Indicators

## Type PB

### Mushroom Push Buttons

CARLO GAVAZZI



- Ø 22mm (Ø0.87") Standard and bezel style
- Mushroom shape
- Ø 40mm (Ø1.57") or Ø 60mm (Ø2.36") head
- Self-hold or spring return
- Illuminated version made by LED
- cULus and CE
- IEC/EN 60947-5-1, UL 508, IEC/EN 60073, IEC/EN 60529

\* Not all configurations available – see page 5 for complete list

## Ordering key

**PB 22S IM4 0 R \***

Series \_\_\_\_\_  
 Dimension and Style \_\_\_\_\_  
 Type \_\_\_\_\_  
 Action \_\_\_\_\_  
 Colour \_\_\_\_\_  
 Symbols \_\_\_\_\_

## Dimensions and styles

22S = Ø22mm (Ø0.87") Standard style  
 22B = Ø22mm (Ø0.87") Bezel style

## Actions

0 = Spring return (Not available for PPM4/PPM6 Types)  
 1 = Maintained

## General data

|                        |                              |
|------------------------|------------------------------|
| Peripheral of actuator | AL                           |
| Actuator               | Pa                           |
| Mechanical life        | ≥ 3 x 10 <sup>6</sup> cycles |
| Operating temperature  | -25 to +70°C (-13 to +158°F) |
| Storage temperature    | -30 to +80°C (-22 to +176°F) |
| Degree of protection   | IP 65                        |

Mushroom push button switches are mechanical switches that are pushed down to open or to close the electric contacts. They are mostly used to start/stop electric circuits or devices like lamps, motors, etc. They should be ordered in parts (operator + holder + contact block) and installed in an enclosure.

## Approvals



## Types

M4 = Mushroom Ø40mm (Ø1.57")  
 M6 = Mushroom Ø60mm (Ø2.36")  
 IM4 = Illuminated<sup>1</sup> mushroom Ø40mm (Ø1.57")

PPM4 = Push-pull mushroom Ø40mm (Ø1.57")  
 PPM6 = Push-pull mushroom Ø60mm (Ø2.36")

<sup>1</sup> = Light function is obtained by the lamp element pg.19

## Colours

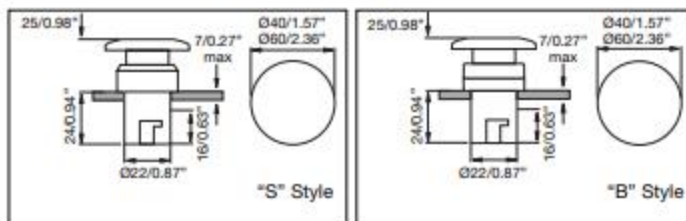
R = Red  
 G = Green  
 K = Black (only not illuminated)

## Symbols

EMS<sup>2</sup> = Emergency Stop      RUN<sup>2</sup> = Push-Stop-Pull-Run

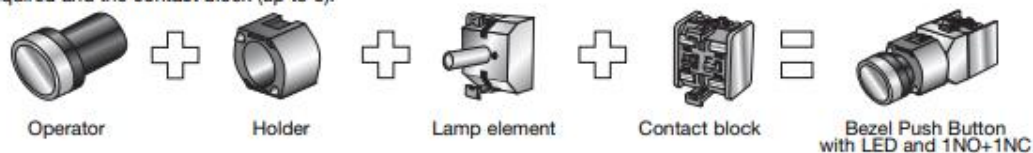
<sup>2</sup> = only for PPM4 and PPM6 types

## Dimensions - Push Buttons mm/inches



## Assembling and Mounting

It comes easy to get a complete product. Just to choose the operator, the holder, the lamp element if illuminated function is required and the contact block (up to 3).



To install it, the only tool needed is a screwdriver. The same used to wiring the contact block can be used to fix the push-button.



The operator will be inserted into the panel.



The holder will be secured at the back by two screws or nuts.



The contact block is snapped on.

## Accessories for Panel Actuators



### Sealing cover IP67

Always on the head of operators, waterproof and dust, IP67.

Silicon rubber

PA SEAL COV



### Protection cover

Always on the head of button, prevent strike and mistaking operation. Lockable.

PC

PA PB COV



### Mounting ring Ø22mm (0.87")

Installed on plastic panel to strengthen mounting.

FE

PA MR 22



### Reducing ring for Pilot Light Ø22mm (0.87")

To mount the Ø22mm (0.87") pilot light into the hole for Ø25mm (0.98") or Ø30mm (1.18") of the panel.

ABS

Ø30mm/Ø1.18" PA RR 3



### Fastening connector for Pilot Light Ø22mm (0.87")

Improve the quality of installation and reduce the time of installations.

PC

PA PL CONN



### Label frame

Hang it on the push button or pilot light, for symbol or text explanation.

PC

10mm/0.39" PA LBF 11  
18mm/0.71" PA LBF 18



### Warning plate

For emergency stop push buttons. Thickness 1.5mm/0.059"

ABS

Ø60mm/Ø2.36" PA WP 6  
Ø90mm/Ø3.54" PA WP 9



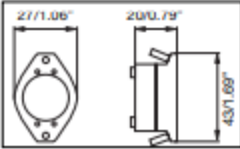
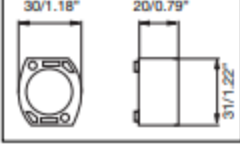
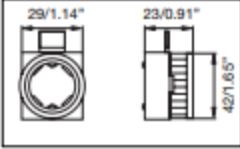
### Panel hole cap Ø22mm (0.87")

For blocking up prepared or useless holes on the panels.

ABS

PA PHC 22

## **Holders**

|                                                                                   |                        |                                   |                                                                                                                         |
|-----------------------------------------------------------------------------------|------------------------|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------|
|  | <b>Holder type "M"</b> |                                   |                                                                                                                         |
|                                                                                   | Code<br>Material       | <b>PB MB M</b><br><b>Zn + PBT</b> |  |
|  | <b>Holder type "P"</b> |                                   |                                                                                                                         |
|                                                                                   | Code<br>Material       | <b>PB MB P</b><br><b>PBT</b>      |  |
|  | <b>Holder type "N"</b> |                                   |                                                                                                                         |
|                                                                                   | Code<br>Material       | <b>PB MB N</b><br><b>PC</b>       |  |

## **Lamp Element**



## **Ordering key**

**PALAMP R 220A\***

Type \_\_\_\_\_  
 Colour \_\_\_\_\_  
 Voltage \_\_\_\_\_

\* Not all configurations available – see page 5 for complete list

## **Approvals**



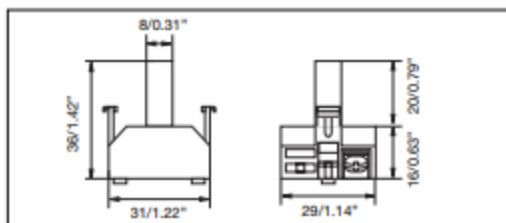
## **Colours**

**R** = Red                      **Y** = Yellow  
**W** = Clear/White        **G** = Green  
**B** = Blue

## **Voltage**

|               |                 |
|---------------|-----------------|
| 12 = 12VAC/DC | 110 = 110VAC/DC |
| 24 = 24VAC/DC | 220A = 220VAC   |

## **Dimensions** mm/inches



## **Technical data**

|                                        |                                  |
|----------------------------------------|----------------------------------|
| Rated imp. withstand voltage $U_{imp}$ | 2500VAC 50Hz 1min.               |
| Rated insulation Voltage $U_i$         | 500VAC                           |
| Allowable voltage fluctuation          | ±20%                             |
| Continuous operating life              | ≥100.000h                        |
| Ultrahigh brightness                   | ≥100cd/m <sup>2</sup> (≥9.29ftc) |
| Applying frequency                     | 50-60Hz                          |
| Current consumption (AC/DC)            | ≤18mA                            |
| Operating temperature                  | -25 to +70°C (-13 to +158°F)     |
| Storage temperature                    | -30 to +80°C (-22 to +176°F)     |

## **Wiring Notes**

- 1) Use 60°C or 75°C copper (CU) conductor and wire size range 18AWG, stranded or solid.
- 2) Terminal tightening torque 0.6Nm (5.3in.lb)
- 3) Recommended external fuse - listed or R/C fuses, Supplemental (JDYX, JDYX2) rated 3A maximum.

# Panel Actuators and Indicators Type PA2 Contact Block

CARLO GAVAZZI



- High switching power
- Double switch
- Industrial applications
- 10A switching capacity
- Up to 500VAC
- Modular mounting (up to 3 elements)
- Screw terminals
- High reliability
- cULus and CE
- According to EN ISO 13850 (only NC slow action)
- IEC/EN 60947-5-1, IEC/EN 60947-5-5, UL 508

\* Not all configurations available – see page 5 for complete list

## Product description

Switching element equipped with two independent elements. Available in different switching configurations. Pole and throw configurations can be single pole single throw (SPST) or double pole single throw (DPST). Elements can be snapped to each other on the bottom, up to 3.

## Approvals



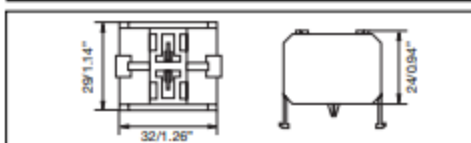
## Technical data

|                                               |                                                                |
|-----------------------------------------------|----------------------------------------------------------------|
| Contact resistance                            | ≤50mΩ                                                          |
| Travel                                        | 5.8 ± 0.2mm (2.28" ± 0.08")                                    |
| Rated insulation Voltage U <sub>i</sub>       | 660VAC/DC (acc. to IEC 60947-5-1)<br>600VAC/DC (acc. to UL508) |
| Rated imp. withstand voltage U <sub>imp</sub> | 2500VAC 50Hz 1min.                                             |
| Minimum switching power                       |                                                                |
| Min Current                                   | 100mA                                                          |
| Min Voltage                                   | 24V                                                            |
| Switch housing                                | PC                                                             |
| Contact parts                                 | Cu                                                             |
| Contact material                              |                                                                |
| Standard                                      | Hard silver                                                    |
| Optional                                      | Gold/silver                                                    |
| Optional for aggressive atmospheres           | Silver/palladium                                               |
| Operating temperature                         | -25 to +70°C (-13 to +158°F)                                   |
| Storage temperature                           | -30 to +80°C (-22 to +176°F)                                   |

## Terminals

|                               |                                       |
|-------------------------------|---------------------------------------|
| <b>Screw terminals</b>        |                                       |
| Max. section single-core wire | 2 x 2.5mm <sup>2</sup> (0.004sq.inch) |
| Max. section stranded wire    | 2 x 1.5mm <sup>2</sup> (0.002sq.inch) |
| Copper conductor wire         | 14 AWG @ 60°C or 75°C                 |
| CU conductor                  | 1.2Nm (10.6in.lb.)                    |
| Terminal tightening torque    |                                       |

## Dimensions mm/inches



## Ordering key

PA 2 110 / 1 \*

Type \_\_\_\_\_  
Number of contacts \_\_\_\_\_  
Contact code \_\_\_\_\_  
Options ( 1 = Snap action  
2 = Slow action with forced opening NC contact)

## Contact code

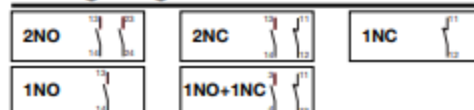
| Contact configuration       | Contact code |
|-----------------------------|--------------|
| 2 NO contacts (DPST)        | 200          |
| 2 NC contacts (DPST)        | 020          |
| 1 NC contact (SPST)         | 010          |
| 1 NO contact (SPST)         | 100          |
| 1 NC + 1 NO contacts (DPST) | 110          |

## Contact characteristics

|                                                  |                     |
|--------------------------------------------------|---------------------|
| <b>Contact Rating AC1</b>                        | <b>10A @ 250VAC</b> |
| <b>Contact Rating</b><br>(acc. to IEC 60947-5-1) | <b>AC15 DC13</b>    |
|                                                  | @ 24V 10A 6A        |
|                                                  | @ 110V 8A 1A        |
|                                                  | @ 220V 6A 0.5A      |
|                                                  | @ 380V 4A -         |
|                                                  | @ 500V 2.5A -       |
| <b>AC Contact Rating</b> (acc. to UL 508)        | <b>A600 B600</b>    |
| B600 (all snap codes)                            | @ 120V 6A 3A        |
| A600 (all slow codes)                            | @ 240V 3A 1.5A      |
|                                                  | @ 480V 1.5A 0.75A   |
|                                                  | @ 600V 1.2A 0.6A    |
| <b>DC Contact Rating</b> (acc. to UL 508)        | <b>Q600 Q300</b>    |
| Q600 (all snap codes)                            | @ 125V 0.55A 0.55A  |
| Q600 (100, 200 slow codes)                       | @ 250V 0.27A 0.27A  |
| Q300 (010, 020, 110 slow codes)                  | @ 480V 0.10A -      |
|                                                  | @ 600V 0.10A -      |

| Contact rating code designation | Terminal | Maximum current, amperes (acc. to UL508) |       |      |       |             |       |      |       | Maximum volt-amperes                              |       |
|---------------------------------|----------|------------------------------------------|-------|------|-------|-------------|-------|------|-------|---------------------------------------------------|-------|
|                                 |          | 120V                                     |       | 240V |       | 480V        |       | 600V |       | Make                                              | Break |
|                                 |          | Make                                     | Break | Make | Break | Make        | Break | Make | Break |                                                   |       |
| A600                            | 10       | 60                                       | 6.00  | 30   | 3.00  | 15          | 1.5   | 12   | 1.2   | 7200                                              | 720   |
| B600                            | 5        | 30                                       | 3.00  | 15   | 1.50  | 7.50        | 0.75  | 6    | 0.6   | 3600                                              | 360   |
| Contact rating code designation | Terminal | Maximum current, amperes (acc. to UL508) |       |      |       |             |       |      |       | Maximum make or break volt-amperes @ 300V or less |       |
|                                 |          | 125V                                     |       | 250V |       | 301 to 600V |       |      |       | Make                                              | Break |
| Q600                            | 2.5      | 2.5                                      | 0.55  | 0.27 | 0.10  | 0.10        | 0.10  | 69   | 69    |                                                   |       |
| Q300                            | 2.5      | 2.5                                      | 0.55  | 0.27 | 0.10  | 0.10        | 0.10  | 69   | 69    |                                                   |       |

## Wiring diagram



# AVAILABLE PORTFOLIO CONFIGURATIONS

## Flush Round Push Buttons

|           |           |
|-----------|-----------|
| PB22BF0B  | PB22BIF0Y |
| PB22BF0G  | PB22SF0B  |
| PB22BF0K  | PB22SF0G  |
| PB22BF0R  | PB22SF0K  |
| PB22BF0W  | PB22SF0R  |
| PB22BF0Y  | PB22SF0Y  |
| PB22BIF0B | PB22SIF0G |
| PB22BIF0G | PB22SIF0R |
| PB22BIF0R | PB22SIF1G |
| PB22BIF0W |           |

## Extended Push Buttons

|           |           |
|-----------|-----------|
| PB22BE0G  | PB22BIE0Y |
| PB22BE0K  | PB22SIE0G |
| PB22BE0R  | PB22SIE0R |
| PB22BIE0R |           |

## Red Emergency Stop Push Buttons

|             |            |
|-------------|------------|
| PB22BEM41R  | PB22SEM41R |
| PB22BEM61R  | PB22SEM61R |
| PB22BKEM41R |            |

## Mushroom Push Buttons

|            |             |
|------------|-------------|
| PB22BIM41R | PB22SM40K   |
| PB22BM40G  | PB22SM40R   |
| PB22BM40R  | PB22SM41G   |
| PB22BM41R  | PB22SM41R   |
| PB22BM60R  | PB22SPPM41R |
| PB22SIM40R | PB22SPPM61R |
| PB22SIM41R |             |

## Buzzer and Flashing Buzzer

|              |               |
|--------------|---------------|
| PL22SBZK110  | PL22SFBZR110  |
| PL22SBZK12   | PL22SFBZR12   |
| PL22SBZK220A | PL22SFBZR220A |
| PL22SBZK24   | PL22SFBZR24   |

## Two Color Pilot Lights

|               |             |
|---------------|-------------|
| PL22STCRG110  | PL22STCRG24 |
| PL22STCRG220A |             |

## Pilot Lights

|              |              |
|--------------|--------------|
| PL22CHLB110  | PL22SFLG24   |
| PL22CHLB24   | PL22SFLR110  |
| PL22CHLG110  | PL22SFLR24   |
| PL22CHLG24   | PL22SFLW110  |
| PL22CHLR110  | PL22SFLW24   |
| PL22CHLR24   | PL22SFLY110  |
| PL22CHLW110  | PL22SFLY24   |
| PL22CHLW24   | PL22SHLG110  |
| PL22CHLY110  | PL22SHLG220A |
| PL22CHLY24   | PL22SHLG24   |
| PL22CLLB220A | PL22SHLR110  |
| PL22CLLB24   | PL22SHLR12   |
| PL22CLLG110  | PL22SHLR220A |
| PL22CLLG220A | PL22SHLR24   |
| PL22CLLG24   | PL22SHLW110  |
| PL22CLLR110  | PL22SHLW24   |
| PL22CLLR220A | PL22SHLY110  |
| PL22CLLR24   | PL22SHLY24   |
| PL22CLLW110  | PL22SLLG110  |
| PL22CLLW220A | PL22SLLG220A |
| PL22CLLW24   | PL22SLLG24   |
| PL22CLLY110  | PL22SLLR110  |
| PL22CLLY12   | PL22SLLR220A |
| PL22CLLY220A | PL22SLLR24   |
| PL22CLLY24   | PL22SLLW24   |
| PL22CRLB24   | PL22SLLY24   |
| PL22SFLB24   | PL22SRLR110  |
| PL22SFLG110  |              |

## Short-Handle Selector Switches

|              |              |
|--------------|--------------|
| PB22BSRS21K  | PB22SISRS21W |
| PB22BSRS22K  | PB22SISRS31G |
| PB22BSRS31K  | PB22SSRS21K  |
| PB22BSRS33K  | PB22SSRS31K  |
| PB22SISRS21R | PB22SSRS32K  |

## Long-Handle Selector Switches

|             |             |
|-------------|-------------|
| PB22BLRS21K | PB22SLRS31K |
| PB22BLRS31K | PB22SLRS32K |
| PB22SLRS21K |             |

## I/O Push Buttons

|            |             |
|------------|-------------|
| PB22SIO0RG | PB22SIOL0RG |
|------------|-------------|

## Key Selector Switches

|              |              |
|--------------|--------------|
| PB22SKRS21KL | PB22SKRS21KR |
|--------------|--------------|

## Push Button Boxes

|           |           |
|-----------|-----------|
| PBBOX1HBG | PBBOX3HBY |
| PBBOX1HBY | PBBOX4HBG |
| PBBOX2HBG | PBBOX4HBY |
| PBBOX2HBY | PBBOX5HBG |
| PBBOX3HBG |           |

## Lamp Element

|             |            |
|-------------|------------|
| PALAMPB110  | PALAMPR24  |
| PALAMPB24   | PALAMPW110 |
| PALAMPG110  | PALAMPW12  |
| PALAMPG220A | PALAMPW24  |
| PALAMPG24   | PALAMPY110 |
| PALAMPR110  | PALAMPY24  |
| PALAMPR220A |            |

## Contact Block

|          |          |
|----------|----------|
| PA2010/1 | PA2100/2 |
| PA2010/2 | PA2110/1 |
| PA2020/1 | PA2110/2 |
| PA2020/2 | PA2200/1 |
| PA2100/1 | PA2200/2 |

## Accessories

|           |          |
|-----------|----------|
| PASEALCOV | PAWP6    |
| PAPBCOV   | PAWP9    |
| PAMR22    | PAPHC22  |
| PALBF11   | PARR3    |
| PALBF18   | PAPLCONN |

## Holders

|       |       |
|-------|-------|
| PBMBM | PBMBP |
| PBMBN |       |